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PROPOSALS FOR IMPROVING THE PATENT SYSTEM

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FOREWORD

The following research study was prepared by Dr. Vannevar Bush at the request of the Subcommittee on Patents, Trademarks, and Copyrights as part of the study of the United States patent system it is conducting pursuant to Senate Resolutions 92 and 167 of the 84th Congress. Dr. Bush's study is one of a number of special studies undertaken for the subcommittee under its mandate "to conduct a * * * complete examination and review of the statutes relating to patents * * *." The authors of these studies have been selected on the basis of their understanding, experience, and vision in dealing with the patent system.

Dr. Bush's long association with the Massachusetts Institute of Technology and the Carnegie Institution of Washington, D. C., his achievements and experience in the fields of science, business, and government, and his active participation in prior studies of the patent system make him uniquely qualified to aid the subcommittee in its present study. He was Chairman of the Science Advisory Board established by the President in 1933 to study the patent system and served as a member of the Patent Survey Committee appointed in 1945 to conduct a similar study. From 1941 to 1946, he was Director of the Office of Scientific Research and Development. More recently, he has been chairman of the Department of Commerce Advisory Committee on the Application of Machines to Patent Office Operations.

Dr. Bush is the author of many articles, monographs, and treatises, including Science, the Endless Frontier (1945), a report to the President on a program for postwar scientific research, and Modern Arms and Free Men (1949). He is a leading authority on such currently crucial public issues as automation, secrecy in research, and electronic computers. The business world's respect for his accomplishments and ability is evidenced by his membership on the board of directors of Metals & Controls Corp., Merck & Co., and American Telephone & Telegraph Co.

Since this is the first of the special studies to be published, it is important to state clearly its relation to the policies and views of the subcommittee. The views expressed in Dr. Bush's study are entirely his own. The subcommittee accepts, and welcomes, the report for consideration and study, but its publication in no way signifies or implies acceptance or approval by the subcommittee or any of its members of the facts, opinions, or recommendations contained in it. Such publication does, however, testify to the subcommittee's belief that the report represents a valuable contribution to the literature concerning the patent system and its operation, and that the public interest will be served by its publication, distribution, and consideration.

(Signed) JOSEPH C. O'MAHONEY,
Chairman, Subcommittee on Patents, Trademarks, and Copyrights, Committee on the Judiciary, United States Senate.

DECEMBER 20, 1956.

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SOME PROPOSALS FOR IMPROVING THE PATENT SYSTEM

A. PURPOSES AND OBJECTIVES OF THE PATENT SYSTEM

Those who built the governmental structure under which we live were exceedingly wise, and they were particularly so when they created a strong patent system based on the Constitution.[1] It has three great objectives:

First, it aims to stimulate both invention and the assiduous search for new applications of knowledge, which is the basis of invention. It does this by placing the inventor in a position to secure a reward.[2]

Second, it seeks to create conditions whereby the venture of funds to finance the hazardous introduction into public use of new devices or processes will be warranted. This is done by protecting the industrial pioneer for a limited time against the uncontrolled competition of those who have not taken the initial financial risk.[3]

Third, it aims to prevent the creation of an industry permeated by the intense secrecy with regard to its processes which characterized the medieval guilds and which can only retard the realization by the public of the benefits of scientific progress. This it does by extending a temporary monopoly to those who, in keeping with the American ideal of openness and frankness, will make a full disclosure of their new ideas so that they may be utilized to the full by those skilled in a particular art.[4]

Our early statesmen were fully on their guard against special privilege or the abuse of monopoly to the detriment of the interests of the public, and they had real reason to be as they viewed the industrial history of the countries from which they or their forebears had come to this land. Yet they appreciated also the necessity for safeguards that would secure to citizens the enjoyment of their personal property in their land and possessions, and extended to them the support of the basic law in excluding others from them. They did not hesitate, moreover, to extend similar ownership to ideas, to authors by copy-

[1] Art. I, sec. 8, of the Constitution of the United States provides that the Congress shall have power "To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."

[2] See *Allen* v. *Hunter*, Fed. Cas. No. 225 (C. C. Ohio, 1855).

[3] This objective is well illustrated by the testimony of Charles F. Kettering, vice president, General Motors Corp., in U. S. Temporary National Economic Committee, Investigation of Concentration of Economic Power, hearings, pt. 2, December 5–16, 1938, pp. 341–345 (referred to hereafter as TNEC).

[4] See *Attorney General ex rel. Hecker* v. *Rumford Chem. Works*, 32 Fed. 608 (C. C. R. I., 1876).

right and to inventors by patent. In fact Thomas Jefferson, who was certainly vocal in regard to the evils of the type of monopoly which had plagued the Colonies from their inception, nevertheless favored strongly a patent system.[5] Since those days we have recognized the advantages of monopoly in the public utility field, and placed it under regulation. We have also enacted antitrust statutes to prevent unreasonable restriction of competition. But the rights granted under patents have remained substantially unchanged. It is the patent monopoly with which we are here primarily concerned. Our forebears made the latter a temporary monopoly and imposed upon it practically no further governmental control.

It worked well. This country has prospered beyond all others in the wide application of new techniques and in advanced industrial processes. Undoubtedly much of this was due to the width of the land in which great homogeneous markets were developed, and to the pioneering spirit of the people which could be applied as well to industrial as to geographic frontiers. Yet the patent system was largely responsible for the vigor of our small enterprises and for the effectiveness with which new things were promptly brought into use.[6] Life was made more comfortable, healthy, and worth living for large numbers of our citizens.

Yet it would be a fallacy to assume that all progress in bringing new devices into use depends upon the inventor, or even upon the industrial pioneer. It is well to emphasize that back of all material innovation lies a great body of science, and that the extension of our scientific knowledge is fully as important as its application. The fundamental scientist, working in his study or his laboratory, is not concerned with the utility of his findings; in fact when he becomes unduly thus concerned he ceases to be a fundamental scientist. He cares little about the patent system, and usually knows practically nothing about it, for it is of no moment whatever in what he does.[7]

To a certain extent this is true even of the applied scientist. And, in this connection, it is notable that there are many inventions made in the course of scientific research which never need the machinery of the patent system in order that they may be useful. Any research scientist in a laboratory who is worth his salt is making inventions every little while, new and useful combinations which would be patentable under the law, but which he never thinks of patenting. His

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[5] Jefferson wrote: "Certainly, an inventor ought to be allowed a right to the benefit of his invention for some certain time. Nobody wishes more than I do that ingenuity should receive liberal encouragement." He was likewise of the opinion that "in the arts, and especially in the mechanical arts, many ingenious improvements are made in consequence of the patent right giving exclusive use of them for 14 years." (U. S. Patent Office, The Story of the American Patent System, 1790–1952, Washington, U. S. Government Printing Office, 1953, p. 1.)

[6] For typical quotations on these benefits of the American patent system see the foreword by Robert L. Lund in Patents and Industrial Progress, by Folk, New York, Harper, 1942, pp. ix–xiii. See also the two pamphlets issued by the National Association of Manufacturers: Patents, Progress, and Prosperity, by William R. Ballard (Economic Series No. 62), September 1953, and The Importance of the United States Patent System, addresses given at seminars on What Inventions Mean to You, held by the patents committee, NAM, 1948–52 (Economic Policy Division Series No. 56), December 1952.

[7] See Inventors Behind the Inventor, by Burlingame, New York, Harcourt, Brace, 1947, and Inventors and Moneymakers, by Taussig, New York, Macmillan, 1915, especially ch. 1, The Instinct of Contrivance.

An apt illustration is provided in a two-page chart on the geneology of an invention (television) in Fortune, vol. 50, December 1954, pp. 134–135.

Benjamin Franklin declined a patent for the "sole vending" of the Pennsylvania fireplace invented by him, with the following comment: "As we enjoy great advantages from the inventions of others, we should be glad of an opportunity to serve others by any invention of ours; and this we should do freely and generously." March of the Iron Men, by Burlingame, New York, Scribners, 1938, p. 79.

ingenuity is devoted to finding ways in which he can get at a scientific result, and the tricks he uses to attain a measurement or to bring materials into a special form are just a part of his overall effort. They may indeed be of use to other researchers as well, and he publishes them freely when he presents his results. Usually they involve procedures that any laboratory may readily adopt, constructing the necessary apparatus from components readily available to all. There is no need whatever for the use of a patent system in order to bring them into use. And no sound scientist would think of attempting to exclude others from the ingenious laboratory procedures which he has found useful in his own research.

Occasionally instruments and the like are invented in scientific laboratories which are of general use, and in such cases the patent system is often of aid in bringing them into use.[8] But these are exceptions. The real point is that, throughout scientific work, especially of a basic nature, inventions are freely made as a part of the scientific research process, yet the operations of the patent system are of secondary moment, although such research provides the basis on which all future technical progress depends.

This attitude among scientists which relegates patents to a position of secondary importance is both understandable and, in many areas of inventive activity, quite sound. Many of them feel that they wish to have nothing to do with the patent system in any way. This is an aspect of their general attitude that, in fundamental science at least, they work to advance man's knowledge and do not wish to be concerned with minor objectives. This attitude is especially strong among medical men, and among those conducting medical research.[9] They do not wish their work for humanity to be contaminated by considerations of profit, or the mores of the market place. Usually they are quite right, and the inventions they make will become of benefit without the aid of patents.

Unfortunately, they often carry this point of view over into an area in which it does not apply, and genuine advances of a technical nature become impeded. This is because they often fail to grasp the fact that the introduction of new methods sometimes requires far more than the mere conception of an idea, and that these special cases require explicit action.

An example will illustrate this point. When the obstetrical forceps were invented, the invention was held secret for a time, and passed down from father to son, while many women suffered unnecessarily.[10] Any scientist who took such a course on an important matter today would certainly be ostracized by his fellows. He would be regarded as

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[8] On the relationship of research and patent departments in industrial corporations, see, for example: The Theory and Practice of Industrial Research, by Hertz, New York, McGraw-Hill, 1950, ch. 13, Patent Policies in Research, pp. 307–333, and The Organization of Industrial Scientific Research, by Mees and Leermakers, New York, McGraw-Hill, 1950, pp. 279–284.

[9] As Dr. Torald Sollmann, dean emeritus of Western Reserve University School of Medicine, wrote in an essay, Fundamentals of Medical Research, published in 1946: "The medical profession traditionally looks askance on patents because by definition they aim to restrict the free use of discoveries that should have the widest possible application to human welfare." In Smith (ed.), Medical Research, a Symposium, Philadelphia, J. P. Lippincott, 1946.

See also American Medical Research, Past and Present, by Shryock, New York, Commonwealth Fund, 1947, pp. 140–144; and Medical Patents, by Palmer, Journal of the American Medical Association, vol. 137, June 5, 1948, pp. 497–508.

[10] See Priests of Lucina, the Story of Obstetrics, by Findley; Boston; Little, Brown, 1939, ch. 12, The Chamberlens, pp. 155–168.

a worthy member of his profession only if he published promptly for the benefit of all his colleagues. Still, even if made known at once, the probability is that it would have been years before such an instrument was manufactured in quantity and generally introduced. The patent system, properly used, could have expedited this process, by rendering it justifiable for some industrial organization to spend the money needed for development, tooling, and introducing such a device.

There are also in-between areas in which the patent system is not of primary or crucial importance in the development of new products, but still can be used to public advantage even where private profit is not the objective. In fact, in cases where scientific laboratories of a nonprofit nature avail themselves of the patent system in cases of this general nature, they usually forego a profit entirely or else, which seems fully justifiable, direct any income which may occur into channels where it is used to extend the research being done for the public benefit.[11]

Thus, there are many inventions made where a patent system, as generally considered, is not of great importance. But this is recited so that there will be no misunderstanding, for there are areas in which it is of great importance.

Another point should perhaps be considered before treating of the system itself. There are two sorts of inventors, those to whom invention is a side issue, an incident in their professional work, and those to whom invention is a central and sometimes exclusive interest. The latter are prone to overemphasize the contributions of the inventor to society, and to regard the patent system as a means, primarily, for extending a reward to those who invent.[12] Actually invention is only one part, and sometimes a relatively minor one, in the long process of rendering a new device or combination useful to the public. There has to be sound science to precede the act of invention to produce the knowledge on which it is based. And following invention there needs to be sound engineering, study of possible markets, development and design, and finally the expenditure of venture capital to provide the facilities for production and for advertising and selling.[13] The patent system was not set up primarily to produce rewards to inventors. It was set up to produce a public benefit by accelerating technical progress, and the reward of the inventor is only one aspect of its operation.[14]

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[11] The patent policies of university and other nonprofit institutions are considered extensively in the two following reports: Nonprofit Research and Patent Management Organization (Publication 372), and University Patent Policies and Practices (Publication 257), by Palmer, Washington, D. C., National Academy of Sciences—National Research Council.

See also footnote 45, infra.

[12] Compare The Psychology of the Inventor, a Study of the Patentee, by Rossman, Washington, Inventors Publishing Co., 1931, ch. 3, Classes of Inventors, and ch. 4, The Characteristics of the Inventor.

[13] As Charles F. Kettering stated in 1938, "If the invention is going to be of any use, it has to be translated into a product and there is such an enormous step between the patent and the product. Mr. Knudsen [then president of General Motors Corp.] mentioned this morning the three steps, the idea step, the development step, and the production step. We call that second step the 'shirt-losing' zone, the development zone." TNEC hearings, pt. 2, December 5–16, 1938, p. 343.

See also New Product Development, by Higgins, Part III, Marketing New Products (Studies in Business Policy No. 69), New York, National Industrial Conference Board, 1954.

[14] *Kendall et al.* v. *Winsor*, 21 How. (U. S.) 322, 327–328 (1858).

As William R. Ballard, adviser of the National Association of Manufacturers committee on patents, said: "The single purpose of the constitutional provision for patents is, of course, to promote the progress of the useful arts. Any benefits to patentees is wholly incidental." Patents, Progress, and Prosperity (Economic Series No. 62), New York, National Association of Manufacturers, 1953, p. 9.

We all know that, when conditions are right and technical advance has proceeded to a certain point, the same invention is likely to arise in a number of places nearly simultaneously.[15] Is there any sense, then, in issuing a patent to the man who may precede his fellows by only a few days? If inventions arise thus spontaneously why is there need for a system to stimulate invention? There are two answers to these questions. In the first place, again, the object in bringing a patent into existence is not solely to stimulate invention or even the research leading to invention. Without a patent system a device could be invented time after time, and come into use only after a long interval, if it is of a nature such that its development and introduction is expensive. Secondly, not all inventions by any means occur simultaneously in a number of places. On the contrary there have often been instances when inventions, which later appeared almost obvious, have not been made for years, while industry plodded along well-worn paths until some unconventional individual, who refused to travel in a groove, found the neat solution which had long been overlooked.[16]

In considering the first objective of the system, therefore, we need to do so with a number of qualifications. There is no need for rewards of this sort to stimulate fundamental research, and outstanding scientists generally scorn any such motivation in what they do. Yet their accomplishment is exceedingly important for our future welfare, even in a material way. Pure science needs encouragement, but not of this sort, and, in this country, with our intense interest in the immediate and the applied, we are only too prone to fail to support adequately the fundamental work which must precede all really important technical advance. The reward is important in encouraging individual inventors, yes, but its importance in this regard is often overestimated. But there is another aspect for which the reward feature assumes its true importance. Invention, today, is seldom a matter of a flash of inspiration.[17] It is far more often the result of arduous work, by a group of individuals, who push the extent of knowledge in a particular field beyond that of their contemporaries, and thus finally grasp ways in which their new concepts can produce new materials, or combinations, or devices, which will meet public needs and desires. This is the way in which most of our practical progress occurs. It is very hard to justify research of this sort on practical matters, expensive as it is, and without any guaranty of useful results, if the products which ensue are immediately to become public property, to be copied at will by competitors.[18] It is in this area, of the justification of extensive research programs, that the reward aspect acquires great importance.

The second objective is allied with the first. Even if research produces a new and useful result, there is a long path, and usually much

[15] See The Psychology of the Inventor, a Study of the Patentee, by Rossman, Washington, Inventors Publishing Co., 1931, ch. 8, Multiple Invention, pp. 131–142; and particularly the table on p. 142 (A List of Some Inventions and Discoveries Made Independently by Two or More Persons, taken from the article Are Inventions Inevitable? by Ogburn and Thomas, Political Science Quarterly, vol. 37, March 1922, pp. 93–98).

[16] *Michle Printing Press & Mfg. Co.* v. *Whitlock Printing Press & Mfg. Co.*, 223 Fed. 647 (2d Cir., 1915).

[17] Cf. *Cuno Engineering Corp.* v. *Automatic Devices Corp.*, 314 U. S. 84 (1941).

[18] See footnote 13, supra; also statement of William H. Davis in U. S. Congress, Senate, Special Committee on Atomic Energy, Atomic Energy Act of 1946, hearings on S. 1717, pt. 1, January 22–23, 1946, pp. 60–63.

expense, before it can become widely used.[19] Lone inventors seldom understand this fully. The old story about the inventor of a mousetrap who had a path promptly worn to his door is sheer myth. And it is to be feared that many men, who have not directly experienced the grief and delay which is inevitably associated with introducing a new thing to an apathetic public, fail to realize the length and difficulty of the trail.

I can probably best illustrate this by an example. Some 30 years ago, I was associated with an inventor, John A. Spencer, who was one of the most ingenious individuals I ever knew. He made an invention in the field of thermostats. What he did was merely to shape a piece of thermostatic metal into a dished shape, like the bottom of an oil can. When heated it would suddenly snap, and it was thus very effective in opening and closing electric circuits. This certainly was a *flash of genius*. After it was done it looked obvious, as though anyone might have thought of it. But there had been hundreds of different forms of thermostats built, and no one had. As soon as it appeared it was fully evident that there was a real use for it; for example, in flatirons, to control their temperature. Did it promptly find acceptance? Not at all. A company was formed and it was nearly 10 years before there was wide use. A recital of the vicissitudes of that company would fill a volume. It nearly folded up at times. It had the usual difficulty, and expense, of convincing large concerns in the field that its patents were valid and needed to be respected. The process of manufacturing these snapping disks so that they would be uniform and reliable took a lot of time and sweat. Yet the device did come into use, and today the patents are expired and it is widely used for all sorts of purposes. The inventor finally found his stock in the company to be valuable. Those who risked their funds made a profit. The company still exists and has given employment to many. Yet none of this could have occurred had the patent system not been in existence. There might, eventually, have been a new sort of thermostat, but there would not have been a new, independent industrial organization to introduce it vigorously and promptly. Nor could it occur if the system becomes weak and the true value of patents highly questionable. The illustrations could be multiplied in which the system performs its proper function in justifying the risking of venture capital in programs which are bound to be hazardous.

The third objective, to discourage the use of secrecy in industry, is more subtle. Those of us who have had our industrial experience under modern American conditions can probably hardly realize the situation which must have obtained in early industry.[20] Every manufacturing concern depended upon the development of secret processes for carrying out its work. Admission of even customers into a plant was unthinkable. The process of hiring away individuals, and more reprehensible methods, must have been rampant. We have come a

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[19] See especially, New Product Introduction for Small Business Owners, by Hilton, (Small Business Management Series No. 17), Washington, D. C., Small Business Administration, 1955. Also, New Product Development: I. Selection Coordination, Financing; II. Research and Engineering; III. Marketing New Products, by Higgins (Studies in Business Policy Nos. 40, 57, 69), New York, National Industrial Conference Board, 1950, 1952, 1954.

Note further, concurring opinion of Frank J., in *Picard* v. *United Aircraft Corp.*, 128 F. 2d 632 (2d Cir. 1942).

[20] See, for example, Guilds in the Middle Ages, by Renard, London, G. Bell, 1919, p. 35.

long distance from this provincial point of view. There are, of course, too many closed doors, even today. When secrecy becomes internal, especially within a research laboratory, with each investigator concealing his thoughts and results, it is a disease. But the whole trend has been in the other direction.

American industry has its secrets today: on matters that are not patentable, on know-how and the like.[21] Inventions, too, are held secret until the patents on them issue or are at least far advanced and, in spite of improvement in this regard in recent years, the period during which a patent application is being prosecuted is still too long.[22] But the whole inclination in this country is in the other direction, and there is no doubt that the presence of the patent system, rendering secrecy unnecessary whenever it applied, has had much to do with a healthy trend.

It is unfortunate that, in recent years we have again had heavy emphasis on secrecy, in connection with military matters and especially in connection with atomic energy. Some of this has been necessary. Some, unfortunately, has been absurd, and we seem to have had an obsession on the subject from which we are slowly recovering. Yet there has been vigorous protest, especially from scientists, on extreme procedures concerning secrecy, and there is no doubt that most of us regard it as a necessary evil which we wish we could dispense with safely.[23] Our inclination is to be frank, and to conceal little. The extreme period of overemphasis on secrecy is, it is to be hoped, a passing phase. And there is no doubt, when one views the progress of industry from a secretive devious affair to a comparatively open procedure with much collaboration and interchange, that the third objective of the patent system has been of genuine importance.

Thus the patent system has been exceedingly valuable to our country in the past. It has been an important foundation of our industrial success in time of peace and is one of the factors responsible for the building up of the reserve of research organizations which served us well in the past war. We are now in a period of extraordinary prosperity. Some of this, without doubt, is due to the enormous impetus given to research by the war. The rapid and startling advent of radar, proximity fuses, atomic bombs, and many other devices, demonstrated beyond question that research and development, aimed at applying scientific results, may be made to accomplish remarkable things. No one could well miss this lesson, although many fail to realize that the extent of success depended upon the fact that there was a great backlog of scientific accomplishment which could be suddenly drawn upon, and hence fail to realize the necessity of keeping this basic science reserve continuously replenished.[24] Since the war

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[21] This is vividly illustrated in Business Espionage, by Smith, Fortune, vol. 53, May 1956, pp. 118–121, 190, 192, 194.

[22] On backlogs and related aspects of Patent Office procedure, see testimony of Robert C. Watson, Commissioner of Patents, U. S. Patent Office, before the Subcommittee on Patents, Trademarks, and Copyrights, of the Senate Committee on the Judiciary, American Patent System, hearings, pursuant to S. Res. 92, October 10–12, 1955, pp. 161–166, 195–198.

[23] See testimony presented on March 7–9, 1956, before the Subcommittee on Government Information of the House Committee on Government Operations, John E. Moss, chairman, on the availability of scientific and technical information. These hearings have not been published to date (June 1, 1956), but excerpts have been printed in the Bulletin of Atomic Scientists, May 1956, pp. 169–176, and the Washington Post, March 21, 1956 (p. 14), and March 28, 1956 (p. 26).

[24] This was stressed repeatedly in the author's Science, the Endless Frontier, a report to the President on a program for postwar scientific research, Washington, U. S. Government Printing Office, 1945.

the great increase in research, in universities, industry, and Government, has been one of the factors, and a very important one, causing a sharp rise in our industrial productivity and an increase in our standard of living. Some of this research is held secret, in connection with military matters. But the great bulk of it is published and interchanged freely, even when it is conducted in industrial laboratories. The pace is so fast that, if one group does not publish promptly, another group is likely to do so on the same accomplishment. There is no doubt that the patent system facilitates this process, for it allows publication to be made broadly as soon as the patentable ideas which appear are covered by application.[25]

The patent system is thus potentially beneficial in at least three ways, and its influence has been on the whole salutary throughout our industrial history.

B. CURRENT PROBLEMS OF THE PATENT SYSTEM

Yet the system is not now working with maximum effectiveness. The principal reason is that science, industry, and the country generally have altered greatly while the patent system has not. There is genuine need to modernize it.[26] Still, great care must be taken lest, in the effort to modernize the patent system, we destroy it and thus decrease the distinguishing vigor it has brought to us as an industrial nation. This caution is not an idle one. Extravagantly uncritical attacks on the patent system have frequently been made, and in the guise of correcting the abuses of the patent system, many well-meaning critics have instead proposed remedies which would do injury to the patent system.

The difficulties and maladjustments within the patent system must be eradicated, not only so that the abuses to which they give rise may be cured, but also so that abuses to the patent system may no longer be committed in their name. In this way only can the patent system continue to serve the country in the coming years as fully and as well as it has in the past. The soundest approach is to examine what the changes in science and industry have been, to determine where they have created maladjustments in the patent system, thus to study why the system falters, and then to seek the most promising remedies.

1. Modern invention—archaic patent system

The patent system was designed primarily for the recognition of an individual inventor who, seizing upon a brilliant idea, could make a model of it or give it a demonstration which could readily be grasped by any practical man. This type of individual has not disappeared; there is still the opportunity for the highly ingenious to see the short cut or the practical embodiment that would otherwise be overlooked. But invention is also a matter of persistence and hard mental labor. Moreover, as science and its applications have become more complex, creative effort by the single inventor has become more and more super-

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[25] The rapid rise of trade associations and industrial research laboratories in the past few decades has greatly facilitated this interchange of information.

[26] In its Review of the American Patent System, dated January 30, 1956 (84th Cong., 2d sess., S. Rept. No. 1464), the Subcommittee on Patents, Trademarks, and Copyrights of the Senate Committee on the Judiciary stated as its first preliminary conclusion: "The present patent system should be adjusted to modern conditions," pp. 1–4.

See also The Prediction of Technical Change, by Gilfillan, Review of Economics and Statistics, vol. 34, November 1952, pp. 368–385.

seded by group collaboration. Witness the growth of large research facilities, both in nonprofit institutions and in commercial organizations. The act of invention now often comes as the culmination of a long-continued scientific collaboration, since individual inventors do not have the technical ability, the equipment, or the money necessary to work out further developments on the basic inventions which have meant so much to modern industrial society.[27]

I have given an example above of a brilliant invention made by an individual. Let me illustrate the other kind of invention, which is more typical of important inventions of today. The thermionic tube is the device which has been mainly responsible for our present radios, radar, television, and a whole range of electronic devices in industry. It is a matter of glass envelopes, vacuum, heated cathodes, and delicate metallic parts. Now it appears that it will soon be superseded, for many if not all of its uses, by the transistor, which is simply a little block of solid material with a few fine wires connected to it. Did this idea spring full blown from the mind of some genius? Not at all. Before it could be produced at all there were years of study on the chemistry and physics of the solid state, and some rather abstruse mathematics concerning the progress of electrons and "holes" through a crystal. One could hardly have happened upon it by accident, for it required that to a pure material there be added an exceedingly minute amount of a special impurity, and keen analysis and experimentation was necessary before one could intelligently prepare the pure material, and find out how to insert just the right amount of the right impurities. Thus the transistor emerged from a long period of intensive group research, principally at the Bell Laboratories. If I had to pick out one inventor to give credit to in this connection I would select William Shockley. But he would be the first to insist that to pick out one individual would be a fallacy, for the act of invention was only one part of a well-ordered research in which many very able scientists and engineers participated.[28]

It is fully as necessary that this collaborative type of creative effort should be stimulated, and that the way be paved for its creations to come into practical use for the benefit of the public as it is to stimulate the individual inventor who works in his own laboratory. Consideration of the best form for the patent system requires keen attention to this modern form of invention.[29]

If one thinks merely of a lone inventor, to be rewarded if he contributes a useful idea for our benefit, the matter seems very simple. The equitable and wise handling of the problem of the great industrial organization, with thousands of patents obtained from its employees and others, appears in quite a different light.

There is still another facet to the situation. It should be remembered that the patent system was set up, not just to reward an inventor or a group of coinventors—that was incidental—but also to facilitate

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[27] Charles F. Kettering, testifying before the TNEC in 1940, noted that we were passing through "the transition period from the individual as an inventor to the group as an inventor * * * group invention rather than individual invention" (hearings, pt. 30, p. 16293).

See also, Is the Rate of Invention Declining? by Stafford, American Journal of Sociology, vol. 57, May 1952, pp. 541, 542.

And compare *Potts* v. *Coe*, 145 F. 2d 27 (Ct. App. D. C. 1944).

[28] The Transistor as an Industrial Research Episode, by Bown, Scientific Monthly, vol. 80, January 1955, pp. 40–46.

[29] See footnote 26, supra; also, The Inventor in Eclipse, by Van Deusen, Fortune, vol. 50, December 1954, pp. 132–133, 197–198, 200, 202.

the advent into use of new devices which would satisfy public needs and desires, and give useful employment. When the system can accomplish this, it is well worth vigorous support. When it tends in the other direction it needs modification.

The modern scene is vastly different from that of the early days of the Republic in regard to what is involved in bringing a new device into practice.[30] When one of our forebears invented a new candlestick, he or his friends could make them in an attic and, if they were really an improvement they could be sold in small quantities and thus create a very small but going business. When Benjamin Franklin produced a new sort of stove, stove manufacturers could readily alter the pattern in their foundries and produce it. Suppose today someone invented a new type of razor, and let us assume it is genuinely different from either the blade or the motorized type, and superior in performance to both. I don't think this is likely to happen, for this field has been well plowed, but it might. It certainly could not be produced and sold in small quantities on a profitable basis in competition with well-entrenched types, for one reason because costs would be too high except under conditions of mass manufacture. It would probably take half a million dollars to put it into production and several millions to impress it sufficiently on the public consciousness to establish its position as a real competitor. I hope that, if someone does invent a really superior razor it will become available and I can buy one. But this can hardly happen unless the patent system is in good order and in tune with modern times and problems.

The increased complexities and costs that attend the introduction of new products into the market have their counterparts in the administrative and judicial processes that attend the securing of patents and their enforcement. The great advances in science since the patent system began to operate in this country are reflected in the fact that many inventions today are highly technical. They cannot be grasped in a moment by a layman. They can be understood, in their trends and implications, only by men of long experience in science and technology. The system in practice has not been able to cope adequately with this situation. The burden on patent examiners has become severe. We expect them to be skilled in many arts, and to understand and critically evaluate arguments which may be decidedly mathematical or couched in highly scientific language.[31] This is one aspect of the sad fact that the Patent Office has not been supported on a scale commensurate with its importance to our economic progress, on which I shall have more to present later in this statement. In addition we have relied upon courts not specially trained in science for the implementation of our patent system.[32] As a result, there is danger that judicial decisions in

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[30] See footnotes 13 and 19, supra.

[31] See The United States Patent Office, What It Is, How It Functions, What It Needs, issued by the U. S. Patent Office, October 3, 1955, in U. S. Congress, Subcommittee on Patents, Trademarks, and Copyrights, of the Senate Committee on the Judiciary. American Patent System, hearings, pursuant to S. Res. 92, October 10–12, 1955, pp. 202–203; and testimony by Allen V. Astin, Director, National Bureau of Standards, in U. S. Congress, Subcommittee on Economic Stabilization, Automation and Technological Change, Joint Committee on the Economic Report, Hearings, October 14–28, 1955, pp. 577–578.

[32] For recommendations for more technically trained personnel attached to courts dealing with patents, see:

Science Advisory Board, Second Report, September 1, 1934, to August 31, 1935, Appendix 6, Report of the Committee on the Relation of the Patent System to the Stimulation of New Industries, Vannevar Bush, chairman, pp. 331–333.

TNEC hearings, pt. 3, January 16–20, 1939. Testimony of Vannevar Bush, pp. 892, 1139–1148. (The latter pages are a reprint of the committee report referred to in the previous reference.)

U. S. Congress, Subcommittee on Patents, Trademarks, and Copyrights of the Senate

patent matters may be based on misconception or superficial grasp. There is also the very serious result that the cost of presenting and rebutting evidence on technical points in patent litigation, conducted before tribunals lacking the necessary special training in advanced science, has become unduly burdensome and expensive. This inequity is further compounded by the fact that suits on the same patent are frequently brought in several of the ten Federal judicial circuits.[33] A patent owner may, therefore, be put to his proof, at great cost, in several different courts with the risk that different, and frequently conflicting, decisions will result. This is especially serious for the individual, or the small and struggling industrial unit, for whom it is most important in the public interest that the full protection of the patent system be secured.

The value of patents is often scoffed at among businessmen today. It is common to characterize them as merely an invitation for expensive litigation.[34] And, unfortunately, there has been increasing basis for this cynical point of view. When a small company, relying entirely upon its patents for the maintenance of its precarious position as a newcomer in the field, with no more resources than would be needed for covering the cost of development and introduction of its new product, is faced by what it believes to be infringement by a strong competitor, it knows that a suit for infringement may stretch out over years, and cost several hundred thousand dollars. It may be inclined to abandon what it believes to be its rights, or to throw in the sponge and sell out, which is not the outcome that is conducive to a desirable increase in the number of small industrial units among us.[35] From my own industrial experience with small companies I have seen little of this in extreme form, where a small company was actually threatened with suits which would exhaust it, but I have seen instances where fear of this sort of sandbagging made it difficult to raise capital, and took the heart out of the young men attempting to pioneer. Of course this problem of unreasonable costs of litigation is far broader than the problem of rendering the patent system fully effective under modern conditions, but it is especially acute in this connection because of the scientific nature of the subject matter. Some of the responsibility for present conditions lies at the door of the

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Committee on the Judiciary, American Patent System, hearings, October 10–12, 1955, testimony of Judge Learned Hand, pp. 132–133.

Opposition to specialized patent judges and patent courts is expressed in the following:

Shall the United States Have a Special Patent Court of Appeals? by Evans, Illinois Law Review, vol. 36, February 1942, pp. 643–647.

A Special Court for Patent Litigation? The Danger of a Specialized Judiciary, by Rifkind, American Bar Association Journal, vol. 37, June 1951, pp. 425–426.

[33] As Judge Schnackenberg stated in *Aghnides* v. *Holden*, 226 F. 2d 949 (7th Cir. 1955), "Aghnides may litigate and relitigate again and again the question of validity of his patent as long as he selects a different defendant in each of the infringement suits which he files, thus avoiding the wholesome doctrine of res adjudicata. This queer result is one which we are unable to avoid. It is a situation which is particularly abhorrent when considered against the backlog of untried cases which clogs our Federal courts. The latter are cases where the litigant asks only for his day in court, not a plurality of days in court as Aghnides is entitled to under existing law. The remedies lie not in our hands. The Congress could by legislation grant relief." See also *Pierce* v. *Allen B. Du Mont Laboratories, Inc.*, 138 F. Supp. 959 (Del. 1956).

[34] See Van Deusen, op. cit., footnote 29, supra.

[35] See U. S. Senate Special Committee To Study Problem of American Small Business, Future of Independent Business. Progress report, January 2, 1947 (Senate Committee Print No. 16), pp. 72–80.

Patents and Free Enterprise, by Hamilton, TNEC Monograph No. 31, Washington, U. S. Government Printing Office, 1941, p. 129.

U. S. Congress, Subcommittee on Patents, Trademarks, and Copyrights of the Senate Committee on the Judiciary, American Patent System, hearings, October 10–12, 1955, especially testimony of Thurman Arnold, pp. 220–226.

courts themselves without doubt, some with the patent bar, some with the Patent Office, and some with the Congress for failing to provide adequate support for the administration of the patent system. A solution is by no means easy, but I will have some tentative suggestions to present below.

2. Economic concentration and monopoly through patents

The increase in the technical complexity of science and the inventive process has had another result of even greater challenge to the patent system. The patent system functions best when unique devices or processes are independently protected by a single patent. The system does not provide adequately for the appropriate handling of complex developments involving devices covered by many patents. As a result, undesirable situations have arisen. For example, through the interchange and retention by the interchanging group of exclusive operating rights under patents, a strong group of industrial units is able to dominate a whole field of manufacture, not merely for the statutory term of a patent grant, but in perpetuity by absorbing in one way or another improvements wherever they appear. The licensing of patents and the exchange of patent rights among patent owners is fundamentally in the public interest when it facilitates manufacture, but it should not be allowed to extend to the point of creating a permanent monopoly over a field of commerce. A permanent monopoly is inconsistent with the whole philosophy of the patent system. When such a monopoly is created through the interchange of licenses, however, the remedy which best serves the public interest is not the curtailment of the licensing or the destruction of the patents, but rather the expansion of the group under license. In this way the public will be assured of the product in question in adequate quantities and at reasonable prices. But the remedy of expanding the group under license is not now often utilized by the courts, and it is not inherently beneficial unless wisely provided for. There are beneficial patent pools, and those which are quite the reverse. It would enable business to proceed with more assurance, and far more effectively, if there were defined in the law the conditions under which cross licensing of patents is in the public interest.[36]

I realize full well that this aspect of the problem, that of patent pooling, is a difficult and intricate matter.[37] Certainly, I would not attempt to present and defend a solution in a brief statement. Rather it calls for a thorough and objective study by a fully representative group, including men with experience in patent litigation, at the bar and on the bench, but including also those who understand the trends of science and its applications, and those who have struggled with the vicissitudes of infant industrial units. I believe it would be very help-

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[36] For one proposal to this end, see A New System for Encouraging Invention, by Gilfillans, Journal of the Patent Office Society, vol. 17, December 1935, pp. 966–970.

[37] The literature on patent pooling is, of course, extensive. See, for example:
Patent Pools and Cross-Licenses, by Toulmin, Virginia Law Review, vol. 22, December 1935, pp. 119–152.
U. S. Congress, House Committee on Patents, Pooling of Patents, hearings on H. R. 4523, February 11–December 12, 1935, Washington, U. S. Government Printing Office, 1936.
The United States Patent System, by Vaughan, Norman, University of Oklahoma Press, 1956, ch. 2, Patent Pools, pp. 39–68.
Compare also my testimony on patent pools before the Temporary National Economic Committee on January 17, 1939, in TNEC hearings, pt. 3, January 16–20, 1939, pp. 887–890.

ful indeed if this set of hearings were followed by a comprehensive study of the problem under congressional auspices, to be followed by the formulation of constructive legislation. It is relatively easy to state some of the aspects of the problem which such a study should tackle. The central puzzle is that of patent pooling, that is, the interchange of licenses among holders of patents. At first this seems very simple, but it certainly is not. Suppose there are two manufacturers, each of whom holds patents, but that these overlap so that neither can put out a fully satisfactory device without infringing the patents of the other. Certainly it would seem to be in the public interest that they should cross-license and proceed, rather than to continue where each puts out a device that is less adequate than the state of the art dictates. But suppose there is a third manufacturer with a patent or two in the field, and he is not admitted to the group. Is he to be left in the position where he must fold up, supply an inferior device, or sell out for a song to the combined group? An easy solution would appear to be to require that all pools be open pools, that is, when cross-licensing occurs at all to provide that all comers must be licensed at reasonable royalties.[38] But on close examination this will be seen to be highly defective. Consider such an open pool in existence, and an independent inventor who makes a striking advance in the field. Is he to be required to deliver his rights for a small royalty, to be determined by some committee of the pool? What he needs is an exclusive position for a time, so that an industrial effort may be built about his advance, and his contribution may be so unique that what he requires in the way of licensing from the pool is essentially minor. The situation is of course worse when there is no pool at all, and a single company controls a whole field through its patents.[39] Then the inventor cannot possibly enter the field and he has only one customer, and is rather strikingly in a buyer's market. And every new patent thus acquired strengthens the company's position and perpetuates the monopoly. There is a good deal of evidence that we had just this sort of situation for some years in the shoe machinery field.[40] But a fully open pool has its disadvantages. What incentive is there, for a member of the pool or an outsider, to work for years at great expense to develop a radically different technical solution for the problems of an industry, if the outcome is that every manufacturer will promptly adopt his advance and he will receive only small royalties? The justification of courageous pioneering lies in the possibility of realizing large profits when success is attained, sufficiently large to submerge the costs of inevitable failures and disappointments. An industry fully cross-licensed at small royalties, is likely to be pedestrian in its advances. It will probably not support research programs of the highest order, un-

[38] See U. S. Attorney General's National Committee To Study the Antitrust Laws, Report, March 31, 1955, pp. 242–247.

[39] *U. S.* v. *Radio Corporation of America*, complaint, November 1954.

[40] See the several shoe machinery cases:
United States v. *Winslow*, 227 U. S. 202 (1913).
United States v. *United Shoe Machinery Company of New Jersey*, 247 U. S. 32 (1918).
United Shoe Machinery Corp. v. *United States*, 258 U. S. 451 (1922).
U. S. v. *United Shoe Machinery Corp.*, 110 F. Supp. 295 (Mass. 1953).
Also:
The Shoe Machinery Case and the Problem of the Good Trust, by Keyes, Quarterly Journal of Economics, vol. 58, May 1954, pp. 287–304.
Corporate Concentration and Public Policy, by Purdy, Lindahl, and Carter (2d edition), New York, Prentice-Hall, 1950, ch. 12, Shoes and Shoe Machinery, pp. 229–249.

less, as has indeed been the case in some instances, it takes a remarkably broad point of view in regard to its public responsibility. Its attention will be devoted to minor advances, and to public appeal of relatively inconsequential nature. It is likely to lean on its suppliers for its innovations. This is not the American way. We want vigorous competition, on technical as on all other aspects, and courageous pioneering. True, this may be expensive and cause local distress at times, but these are the price of progress. With all the fine attainments of our automobile industry, especially in the use of mass production processes, I feel that the man from Mars might consider that it does not measure up to American ideals, on the score of radical technical advance, when compared to European attainments.[41] And I believe an unduly soft type of patent handling is one of the reasons for the situation.

On this whole subject of patent pooling we have thus far relied principally upon the antitrust laws.[42] There is indeed an interrelationship, for patents are property, and the improper use of property to limit competition by combinations is properly a subject for antitrust consideration. It has no applicability to the conferring of monopoly rights on an individual by the issuance of a patent, and should not, and comes into effect only when combinations of those rights are involved. But the antitrust laws are a blunt bludgeon with which to deal with the subtleties of the problem of patent licensing. If a combination in restraint of trade appears, of the ordinary sort, a solution in the public interest may be simply to dissolve the combination. But to do so, and leave each fragment with its own patents only would be obviously disastrous. To require general licensing of all comers at small royalties may produce just the deadly inertia and lack of initiative in an industry which the patent system is supposed to forestall. And destroying the patents, by requiring free licensing, may be even worse and in the same direction. The problem of patent pooling is of sufficient moment, and of such extraordinary complexity, to warrant it being covered by its own body of legislation. Industry generally, and judges too, no doubt, would welcome constructive steps in that direction. But the wise formulation of such legislation calls for deep study by a competent group.

In this connection it has been my experience that, among attorneys who practice general law, the prevalence of profound ignorance of the patent structure is at times appalling. In fairness I believe it should be added that among members of the patent bar there are far too few whose broad grasp leads them to understand fully the interrelationships between the patent system, the modern status of applied science, and the economic progress of society generally. But there are some who have the full qualification for objective and thorough counsel and advice, and their efforts should be enlisted.

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[41] See especially Patents and Competition in the Automobile Industry, by Welsh, Law and Contemporary Problems, vol. 13, spring 1948, pp. 260–277.
Also TNEC hearings, pt. 2, December 5–16, 1938, pp. 256–376, 669–735.

[42] The many references to this subject include the following:
Patent Property and Antimonopoly Laws, by Barnett, Indianapolis, Bobbs-Merrill Co., 1943.
Patents and Antitrust Law, by Wood, Chicago, Commerce Clearing House, 1942.
U. S. Attorney General's National Committee To Study the Antitrust Laws, Report, March 31, 1955, ch. 5, Patent-Antitrust Problems, pp. 223–260.
Patent Pooling and the Sherman Act, Columbia Law Review, vol. 50, December 1950, pp. 1113–1123.
Patent Pooling and the Antitrust Laws, University of Chicago Law Review, vol. 17, winter, 1950, pp. 357–375.

3. Invalidation of issued patents

A common fallacy among laymen, and judges are not free from this disability, is to regard the act of invention as easy—after it has been done, and by hindsight. True, there are altogether too many patents issued on the trivial and the obvious. An appreciable part of the burden on the Patent Office, and on industry, is due to the fact that the standards of invention have not been held sufficiently high, and because a failure to file on a trivial matter may result in the appearance of an embarrassing patent in other hands. But the cure for this does not lie in the destruction of patents by lay judges.[43] It lies in improved procedure, developed through careful and thorough study by independent, objective, citizens, who have the scientific and technical background to understand it fully.

We need, badly, freshly defined criteria of invention.[44] The guiding principle should be to provide for the issuance of patents in ways that will most effectively advance the public interest, and by fair rules that are impartially applied to all applications. At present we have too many patents issued on the obvious, but great care is needed in restricting on this front, for many times the apparently obvious does not appear for years, and might not appear at all, if it were not for the thoughts of some clever individual who sees the neat solution we all miss. When a new result, of patentable nature, emerges from long study and research, it is unlikely that the result will be trivial. The Patent Office should not be called upon in any way to evaluate the probable commercial impact of a patent; that is hardly its function. We can be proud of the fact that the citizen who applies for a patent stands on his own feet, and that his arguments are utterly impartially evaluated. The record of the Patent Office in this regard, and in regard to all aspects of fidelity to a public trust, is admirable, and its detached position should be fully preserved. But better criteria of invention would remove a severe load from its back, and from the backs of industry and the courts.

One of the difficulties comes from the frequent tendency to identify patents as such with objectionable monopoly. There are a surprising number of laymen who feel that whenever a patent is destroyed, as by "dedicating it to the public," a public benefit is conferred. This is a strange point of view. It holds that a piece of property, which is what a patent is, created by an act of the Patent Office under the statutes, is in some way evil. No doubt there are times when abolishing a particular patent, if it could be accomplished, would be a good thing, but this is far from a generality. No doubt, also, there are times when "dedication to the public" is justifiable, for example when a quasi-public institution holds a patent on a device which would come into

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[43] As Supreme Court Justice Jackson, dissenting in *Jungersen* v. *Ostby & Barton Co.*, 335 U. S. 560, at 572, stated, January 3, 1949:

"It would not be difficult to cite many instances of patents that have been granted, improperly I think, and without adequate tests of invention by the Patent Office. But I doubt that the remedy for such Patent Office passion for granting patents is an equally strong passion in this Court for striking them down so that the only patent that is valid is one which this Court has not been able to get its hands on."

[44] See, for example, Efforts To Establish a Statutory Standard of Invention, by Edwards. Prepared for the Subcommittee on Patents, Trademarks, and Copyrights of the Senate Committee on the Judiciary. Washington, Library of Congress, Legislative Reference Service, February 14, 1956, revised to October 15, 1956.

Also, The Nature of Patentable Invention: Its Attributes and Definition, by Hayes, 2d edition, Cambridge, Mass., Addison-Wesley Press; 1948. The Impact of Recent Supreme Court Cases on the Question of Patentable Invention, by Davis, Illinois Law Review, vol. 44, March–April 1949, pp. 41–48.

use whether there were a patent on it or not. But if a patent on a device is thus destroyed, and venture funds would be needed to develop the device and put it into use, the public may not secure the benefit the device could confer for many years if at all.

There is a significant difference here between a patent and other property. For one difference a patent has a limited and specified life. A patent is created to achieve a purpose, namely to further the introduction of new combinations for the benefit of the public. At times it is not needed, as the introduction will occur anyway, and in such cases it can be in effect annulled, by providing for free licensing, without doing any harm. But, even so, it may have been good judgment to apply for it and secure its issuance, in order to ensure that a patent on the same idea would not issue in other hands. Mere publication is a less effective defensive measure than patenting since the former is not a complete barrier against the appearance of a patent, applied for by one who was not the original inventor, if the latter in effect abandons his rights, for publication becomes a barrier only after an interval. Nonprofit organizations, anxious to manage the inventories which may arise in connection with their affairs fully in the public interest are often confronted by a quandary in this regard. And they have no easy way out by merely obtaining patents and announcing that they will license freely without royalty.[45] I have had some experience on this problem. Before the war, when I was located at the Massachusetts Institute of Technology, a colleague and I invented a device which we felt was a worthwhile addition to equipment for data handling. We filed a patent application and arranged that any future income that might flow from it would be made available to MIT. In the pressure of war work the patent application was abandoned. After the war a department of the Government was anxious to obtain such devices for its work. But no commercial concern, naturally, wished to develop such devices at its own expense for sale generally unless its investment in development could be protected. As a result the department paid the full expense of building a machine for its use, but this was a rather special machine and no commercial use followed. I might add that, in this fast moving field, this particular device is now practically obsolete. In this case loss of the patent did, however, in my opinion do real harm. On the other hand, many of us have no doubt seen instances where we felt that a patent stood in the way of progress. Similarly we see cases in which a building is an eyesore, and feel it should be destroyed. In some instances we may tear down such buildings and make a public park, duly compensating the owners of course. But we move with great care in such cases, for inroads upon the principle of the sanctity of private property are not to be undertaken lightly. I doubt whether the same point of view is always present when courts invalidate a patent, and the conditions are indeed not the same. But the cure for the undesirable aspects of the performance of the patent system does not lie in an inclination to invalidate patents generally in any doubtful cases; it lies in bringing the system itself more into tune with modern conditions. And, unfortunately, the result of recent tendencies to invalidate have undermined confidence in the system

[45] Cf. the experience of the Wisconsin Alumni Research Foundation, described among other places in American Medical Research, by Shryock, pp. 142–143.

without causing remedial action to be taken in regard to its genuine faults.[46]

4. Patent suppression

The patent system did not contemplate a complex industrial society under which it might be not only possible, but financially advantageous, for a limited group to purchase patents and withhold from the public the benefits of new inventions. The present patent grant imposes no duty on its owner to bring the invention into use.[47] Yet the public interest, in which the grant was supposedly made, is directly thwarted if the enjoyment of new things is unreasonably delayed. The individual should have freedom in the use of his property, but a patent is a special type of property and is peculiarly subject to considerations of public interest. Neither the cross-licensing, nor the acquisition, nor the retention of patent rights should be allowed to proceed to the point where a thing which the public wants, and for which there is no equally good substitute, is artificially withheld from public use. The patent system should facilitate the introduction of new devices, not prevent it.

While instances are undoubtedly infrequent in which the patent system has been used to suppress the introduction of an invention for which there was a genuine public need, that situation is, in some quarters, believed to have existed many times. Many connected with the operation of the patent system will state that suppression never occurs.[48] I have not seen a perfectly bald case myself, where a new device was arbitrarily withheld and there was no good substitute. It would be very seldom that there would be any inclination thus to suppress, with the keen competition we have in most fields, for any organization that took a dog-in-the-manger attitude of this sort would soon find his competitors getting the jump on him. It is very seldom that there is only one way of securing a particular desirable result. I have seen, many times, the advent of devices delayed because the inventor could not find support, and I think we would see less of this if the system worked more smoothly. Many years ago I examined into a device which had become so involved with poor patenting and general confusion that no one would touch it. This was a gyroscopic

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[46] Among the many articles criticising extensive invalidation of patents by the courts are the following:

The Patent Law and the American System of Reward, by Freeman, Ohio Bar, vol. 25, July 7, 1952, pp. 491–497.

The Judicial Erosion of Our Patent System: A Threat to Inventive Initiative, by Posnack, American Bar Association Journal, vol. 37, May 1951, pp. 357–360, 406–407.

See also (1) footnote 32, supra; (2) U. S. Congress, Subcommittee on Patents, Trademarks, and Copyrights of the Senate Committee on the Judiciary, American Patent System, hearings, October 10–12, 1956: testimony of, among others, Jo Baily Brown, pp. 32–34, 107; Louis R. Robertson, pp. 138–142; Elwin A. Andrus, pp. 243–245; Karl Lutz, pp. 309–331; also statistical report on adjudicated patents, 1948–54, pp. 176–185, submitted by P. J. Federico; and (3) U. S. Congress, Subcommittee on Patents, Trademarks, and Copyrights of the Senate Committee on the Judiciary, Review of the American Patent System, Report, January 30, 1956, pp. 4–5.

[47] *Continental Paper Bag* v. *Eastern Paper Bag*, 210 U. S. 405 (1908).

[48] For articles denying or minimizing suppression of patents, see, for example:

The Truth About a 215-Mile Carburetor, by Getty, Journal of the Patent Office Society, vol. 36, August 1954, pp. 544–554.

Patents and National Defense, by Hoar, Army Ordnance, vol. 31, September–October 1946, pp. 161–162.

Suppression of Patents, by Hoar, Army Ordnance, vol. 31, March–April 1947.

The Future of Industrial Research, by Midgley, New York, Standard Oil Co. (N. J.), 1944, p. 11.

For articles stressing the existence or prevalence of patent suppression, see:

Resistances to the Adoption of Technological Innovations, by Stern, in United States National Resources Committee Technological Trends and National Policy, Washington, U. S. Government Printing Office, June 1937, pp. 39–66.

The United States Patent System, by Vaughan. Norman, University of Oklahoma Press, 1956, ch. 8, Suppression of Patents, pp. 227–260.

compass of a radically different sort, which appeared to me to fill a genuine need for a simple and relatively unprecise instrument for smaller craft than those that could afford excellent and expensive devices. Moreover this instrument involved some very clever usage of air film supported bearings and the like, procedures which are now just coming into use after more than 20 years. The fault here did not lie entirely with the patent system by any means. And this particular suppression certainly was not intentional. I have seen, also, instances in which improvements were withheld by a company until they felt they were fully warranted in introducing them. It does not make sense to disrupt production, incur changeover costs, and cause temporary unemployment to introduce at once every possible change in a product which will at all improve performance. No doubt judgment on such a matter often errs in both directions. But there is a safeguard present, for patents expire, and if there is much delay their possible value is lost. And even moderate delay is hazardous in a rapidly moving competitive field. However, whether or not the suppression of inventions is serious or infrequent, it is clear that such a situation should not be allowed to exist and that action designed to eliminate the very possibility of a successful and genuine suppression of inventions is in the public interest, if a means for such action, which would not cause damage in other ways, can be devised.

5. Detrimental effect of an inadequate patent system to new and small businesses

As scientific knowledge has broadened there has been an increased progression, not only in the interest in science, but inevitably, in the field of scientific application and in the opportunity for invention. The burden on the Patent Office has accordingly been increasingly great. One result has been that patents issued by the Patent Office, although presumptively valid, have too often failed to withstand examination by the courts.[49] Unless this situation is cured and the validity of the patent grant strengthened, the venture capital required to finance new inventions will be more and more difficult to obtain. Steps need to be taken to support the Patent Office adequately and to insure that the patents which it issues are in fact valid.

Our patent system has clearly failed, in a number of ways, fully to keep pace with the changes in science and in industry. The Patent Office, for example, has not been able to handle carefully and expeditiously the great mass of complex scientific material thrust upon it.[50] Nor have the courts been able to handle either with wisdom or with dispatch the technical issues of great complexity which have come to them in increasing numbers for decision.[51] The increasing tendency of

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[49] See statistics on patent invalidity in U. S. Congress, Subcommittee on Patents, Trademarks, and Copyrights, of the Senate Committee on the Judiciary, American Patent System, hearings, October 10–12, 1955, pp. 176–185, Adjudicated Patents, 1948–54, submitted by P. J. Federico.

[50] See footnotes 22 and 31, supra; also, U. S. Department of Commerce, Advisory Committee on Application of Machines to Patent Office Operations, Report, December 22, 1954, Washington, U. S. Department of Commerce.

[51] In 1911, Judge Learned Hand noted, in *Parke-Davis & Co.* v. *H. K. Mulford Co.*, 189 Fed. 95, at 115:

"How long we shall continue to blunder along without the aid of unpartisan and authoritative scientific assistance in the administration of justice, no one knows; but all fair persons not conventionalized by provincial legal habits of mind ought, I should think, unite to effect some such advance."

This statement is quoted 32 years later by Justice Frankfurter, dissenting in *Marconi Wireless Co.* v. *U. S.*, 320 U. S. 1, at 61, who stated further:

"It is an old observation that the training of Anglo-American judges ill fits them to discharge the duties cast upon them by patent legislation * * * However, so long as the Congress, for the purposes of patentability, makes the determination of originality a

courts to invalidate patents throws a pall of doubt over the entire system. Inventors are discouraged. Businessmen are loath to risk capital in new ventures which depend upon patents. The cure for this situation is, first, to aid the Patent Office to do a better job and, second, to facilitate the difficult task of courts in dealing with patent cases.[52]

Since the war, a large number of small industrial manufacturing units have been created all over the country. They are often manned by young men who were thrown out of their grooves during the war, and never returned. These industrial units revolve, usually, about an idea—for an instrument or an electronic device or the like—which can be successfully made in small quantities, and which has a limited but attractive market. I believe that the Patent Office itself is attempting to evaluate the extent of this decidedly interesting development. I have had personal contact with dozens of these small companies which are competing successfully, in very many cases, with large, established industrial units. They can do so because of their flexibility and specialization. But very many of these new ventures depend for their very life upon the patent system to protect them in their infancy against cutthroat competition or the weight of enormous companies in their field. Ever since this country was founded, new industrial units have thus come into being, to succumb or to be successful. They have been absorbed by larger companies very frequently, but some have grown to be large themselves. Every company in this country was once small. Many got their start because they offered something new which the public wanted and would pay for, and because the patent system held an umbrella over their heads until they could stand the full rigor of the industrial climate. In my younger days, I was active, with a number of vigorous friends, in this sort of venture. We put together a number of new companies. Most of them succumbed, but a few survived and grew up. One was the Raytheon Manufacturing Co. No one today would feel that it is small or weak, although I hasten to say that I moved out of it many years ago, and its excellent performance in supporting defense objectives during the war and its healthy growth since, were entirely due to others. But in its early days it was most certainly precarious. And the patent system was its main reliance in carving out a place for itself in the industrial complex. We have allowed this patent system to become relatively weak, and we should reverse the trend. It should always be remembered that one of the greatest safeguards we have in this country against undue commercial concentration is the continued advent of new, small, aggressive industrial units put together by pioneers.

C. RECOMMENDATIONS FOR IMPROVING THE PATENT SYSTEM

There are many aspects to this problem of strengthening the system. The following suggestions are offered, not because they are regarded as in any sense a cure-all, but because they seem to get at the heart of

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judicial function, judges must overcome their scientific incompetence as best they can. But consciousness of their limitations should make them vigilant against importing their own notions of the nature of the creative process into congressional legislation * * * Above all, judges must avoid the subtle temptation of taking scientific phenomena out of their contemporaneous setting and reading them with a retrospective eye."

[52] See Thinking Ahead, by Spencer, Harvard Business Review, vol. 40, May–June 1956, pp. 21–22, 24, 26, 28, 30, 32, 35, 166, 168.

several of the primary difficulties of the system as it stands. Many other suggestions could be offered and have been offered. I am not sure that after full discussion and argument I would still support the legal remedies I present; these suggestions may have serious faults which I do not now see. But I have felt that this statement should attempt, if possible, to get down to brass tacks and not end in generalities. I hope, at least, to provoke discussion of the explicit and the concrete.

1. Increase the presumptive validity of patents

(*a*) *The Patent Office should exert more effort to insure that the patents it issues are truly valid.*—To this end, the Congress should make larger direct appropriations to the Patent Office. The additional funds should be expended both for personnel and for facilities. At the present time there is a considerable backlog of work in the Office, and the staff is heavily loaded. For one matter, a reclassification of patents, badly needed to bring the work up to date, cannot be completed for some years. The Commissioner of Patents should have an adequate staff, freed from routine duties, and capable of planning ahead and of studying means for facilitating current work.

(*b*) *More complete Patent Office examination of prior art; improved classification, adequate budget.*—A more careful acquisition and examination of technical literature, both domestic and foreign, by the Patent Office before a patent is issued will distinctly lessen the possibility that issued patents will be overthrown on the basis of previously unnoticed publications. A committee, of which I was chairman, recently recommended that mechanization for the search of literature and prior patents be introduced in the Patent Office, and proposed ways of arriving at this result.[53] Appropriate mechanization is greatly facilitating the conduct of various forms of business. It appears that it could be of especial benefit in the Patent Office. There are some 7 million documents in the Office to which reference is made in the course of examination of an application. Even so this by no means covers the publications which may be pertinent. In spite of a system of classification to aid search, and in spite of the fact that about half the time of 600 examiners is spent in searching this complex maze of material, it is inevitable that important references will be overlooked.[54] Many times, when this occurs, it places a severe burden on industry, the courts, and the inventor himself. An invalid patent can do a lot of damage. There are those who feel that this particular problem, because of its diverse nature, can not be readily solved by mechanical means. Certainly the experience of examiners, who have become familiar with special fields through long experience should not be sacrificed. But modern data-handling equipment is exceedingly flexible and versatile. It is often thought of, by those who do not understand it, as a mere card shuffling affair. But it is far more than this. It can have a memory, so that the experience of one search will become available to other searchers. It can be fast and comprehensive.

[53] See op. cit., supra, footnote 50. Also Progress of Research in Machine Searching for the Patent Office, by Jenney, American Patent Law Association Bulletin, March 1956, pp. 123–125.

[54] See table submitted by P. J. Federico, Examiner in Chief, Patent Office, Washington, D. C., in U. S. Congress, Subcommittee on Patents, Trademarks, and Copyrights, of the Senate Committee on the Judiciary, American Patent System, hearings, October 10–12, 1955, pp. 291–293.

It can even be arranged to facilitate its own evolution, as its subject matter grows and the art changes. The arrangements for proceeding toward an adequate and well-thought-out mechanization are excellent. There is a committee in the Office studying the applicability.[55] The Bureau of Standards has undertaken to investigate the best applicable mechanism. An advisory committee, of highly competent individuals serving voluntarily, is engaged in guiding the development. I trust that adequate funds will be available for the support of this important move.

There is the strongest kind of public interest in having this job done well. It cannot be accomplished without additional staff and additional funds. Moreover, the necessary additional money should come from public funds and not from inventors' fees. This is a matter of public responsibility. The cost of patent administration cannot be made primarily the responsibility of the inventors through patent fees without unduly burdening many worthy inventors.

It should not be forgotten, in this connection, that the body of issued patents is intended to supply to citizens generally a complete reference on the current state of technical fields in which progress is being made. It has by no means, in recent years, been as valuable in this regard as it might be. This is partly due to its great bulk, and partly due to the difficulty of consulting it in its present form. If it were fully mechanized, and especially if its subject matter included literature references as well as prior patents, it could become very useful indeed. In fact, by making duplicate cards or tapes or the like available, there could be made available to libraries and to industry a highly valuable means of keeping up to date in our rapidly evolving techniques. There is no way, in my opinion, that the Department of Commerce could be of more genuine aid to industry than by developing these possibilities to the utmost.

(*c*) *Opposition proceedings.*—It has often been suggested that, when a patent is ready for issue, its general nature be made known and the submission of references by interested parties invited. It would be expensive to do this, and the Patent Office would need more funds if it were to be introduced as a procedure. But it would most certainly result in very few patents being issued and later found invalid because of prior descriptions in scientific or technical literature. Those in the line of business to which the patent referred would have great incentive to submit references. It would greatly decrease the number of patent applications filed on doubtful matters, merely as a precaution against patents appearing in the hands of competitors. It would undoubtedly save business far more than its total cost. It would do no harm to the individual inventor. There is no more cruel act than to issue to a lone inventor a patent which he trusted as valid, only to find later that he was not the original inventor at all. Of course such a procedure needs to be safeguarded against undue delay; there should be no possibility of argument that would allow a vigorous group to block the application of an individual inventor indefinitely. The submission of references, and brief statements regarding them, should be all that should be allowed. The Office should still adhere to the procedure of maintaining an applicant's material secret until it has formu-

[55] See article by Jenney in footnote 53, supra.

lated a patent ready for issuance to him, and the procedure here suggested should be a final step leading only to one Office action to which the inventor may respond. There is no doubt that it places a burden on industry, but this would be greatly lessened when mechanization of search becomes accomplished. There are numerous pros and cons. But the procedure here suggested, which has been advanced many times, certainly warrants careful examination.

2. Assist the courts in handling patent suits

It is unreasonable to require judges, skilled in the law but not in science, to judge the merits of highly technical or scientific matters except in special courts where the judges can become, after some years, themselves fully versed in special technical fields.[56]

It is recommended, therefore, that technical matters involving patents be determined by a special tribunal set up for the purpose. For example, whenever the validity of an issued patent is challenged before any court, or whenever scientific and technical questions involving the validity, scope, or infringement of issued patents are raised in any court, whether by a declaratory judgment proceeding or otherwise, all such issues and questions should be referred by the courts in which they arise to a special administrative tribunal for findings of fact.

It is recommended that such an administrative tribunal be established within the Department of Commerce. It should be independent of the Patent Office, but should have complete access to the files of that Office pertinent to any cases before it. This should include bringing examiners before it for testimony. Its procedures should be similar to those which have become common for administrative tribunals generally. It should certainly have the authority, and the funds, to call before it and to advise with independent experts in the field, in addition to examining the experts provided by litigants. This tribunal should be staffed, by Presidential appointment, with the most competent men available.

It should be the function of such a tribunal, upon any reference by a court, to give full public notice of hearings on the matters raised by the reference. At such hearings the tribunal should be enabled to receive evidence and argument offered by any interested person, whether or not a party to the action pending before the court. This, however, should not prevent a third party from later raising the same or similar issues in the courts, especially upon the finding of new evidence.

The decisions of this tribunal upon matters referred to it by a court, together with all pertinent findings of fact, should promptly be made available to the referring court. Thereafter, the factual findings by the tribunal should be final and conclusive on all matters in issue, subject to the normal considerations of judicial review of administrative findings. It should be left to the courts to determine whether patents should be invalidated, and to specify relief in cases of infringement. This follows since legal questions, entirely apart

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[56] See report and bibliography on a Single Court of Patent Appeals being prepared by the American Law Division, Legislative Reference Service, Library of Congress, for the Subcommittee on Patents, Trademarks, and Copyrights of the Senate Committee on the Judiciary.

See also footnote 51, supra, and Judge Frank's concurring opinion in *Picard* v. *United Aircraft Corporation*, 128 F. 2d 632, at 639–640 (2d Cir. 1942).

from the technical facts involved, will often arise. But the burden on the courts would be greatly reduced, and transferred elsewhere to be handled at less cost and delay.

In this way it should be possible to secure sound, expeditious, and not too costly decisions on patent questions. Moreover, the number of suits filed in more than one court should decline abruptly after this procedure is inaugurated. Similarly the presumptive validity of issued patents should be enormously strengthened.

It is fitting that technical issues of this kind be resolved in a tribunal specially qualified for the purpose.[57] It is also fitting that this tribunal should have the full benefit of the facilities and records of the Patent Office. Moreover, patent litigations usually present issues, facts, and claims which were not before the Patent Office when a patent was originally issued, and it is desirable that a tribunal close to the Patent Office have an opportunity to review issued patents in the light of these newly presented issues, facts, and claims. This is particularly so, since very frequently the issues, facts, and claims which are subsequently raised in litigation before the courts would have precluded the original issuance of the patent had they been raised at the time in the Patent Office.[58]

3. The misuse of patents, so as to perpetuate patent monopolies through combinations, cross-licensing and improvement patents, should be remedied

Exchange of licenses among patent owners is in general desirable. Limited monopoly for the statutory period by a single industrial unit, based on its own original patents together with such licenses from others as will enable it to operate, is also desirable. The situation to be prevented is one where, through patent interchange and the retention by the interchanging group of exclusive operating rights under patents, a combination of industrial units dominates a given field of commerce, excluding newcomers therefrom. This situation becomes even more undesirable when it is perpetuated by continuing accretions to its patent structure. This cannot be controlled to maximum public advantage under the Antitrust Acts, for they were not designed with this specialized problem especially in mind. The doctrine of misuse, which bars relief to the plaintiff in infringement suits, often connected with antitrust violation, has resulted in destruction of patents in cases where other action could be more beneficial to the patent system as a whole. We should have a sound patent system, and then the destruction of the patent grant should be earnestly avoided. Legislative guidance as to remedies would greatly aid the courts in this matter.

Similarly, although continued improvement of products and processes is most essential, patents on improvements should not be a means of perpetuating the original and limited monopoly afforded by an earlier patent. While it is in the public interest that full patent protection should be given to a basic invention in order that venture capital may be attracted to its support, the perpetuation of that patent monopoly is often not necessary to bring improvements on that invention into use for the public benefit. In particular, if there is no

[57] Invention and Public Policy, by Stedman, Law and Contemporary Problems, vol. 12, autumn 1947, pp. 649–679, especially p. 659 and references cited on that page.
[58] See footnote 54, supra.

serious competition in the field of commerce covered by a patent, the introduction, by the owner of the patent, of an improvement into use in that field does not depend upon the extension of a patent monopoly to the improvement. In such a situation, it is normally sufficient if the patent owner is assured of a return in the form of reasonable royalties from general licensing. In a situation, however, where the field of commerce covered by a patent is highly competitive the extension to the owner of the patent of a temporary patent monopoly with regard to improvements may still be necessary in order to attract the venture capital needed both for research on improvements and for the introduction of improvements into use.

To prevent the perpetuation of business monopolies through the use of patents on improvements, accordingly, a remedy should be devised. Such a remedy should draw a distinction, however, between a competitive situation, where the earnest search for improvements becomes a feature of the competition, and the situation where basic patents give unitary control over the art, and patents on improvements merely perpetuate that control. In the former case, the protection of a temporary patent monopoly for the improvement is essential.

New legislation is needed. The following suggestions are offered:

(*a*) Provide by law that, in any suit for infringement of a patent, when it is established (i) that the plaintiff has joined with others by reason of an interchange of patent rights in a combination which unreasonably dominates a general field of commerce to which the allegedly infringed patent pertains; (ii) that the patent has been infringed; and (iii) that the infringement occurred in the field of commerce thus dominated, then the court shall, if the patent is held to be valid and if the plaintiff is otherwise entitled to relief, determine a reasonable royalty for the use of the patent under a nonexclusive license, and shall decree both that the defendant pay damages computed on the basis of such a royalty for the past infringement and that the defendant may enjoy the patent thereafter, provided he pay for the privilege on the basis of the royalty thus fixed by the court. This judicial remedy should be in lieu of other relief and should be applied in the appropriate case to the exclusion of any defense based on the antitrust laws that the defendant may offer. This legislation is intended to render the course of the courts clear in cases of this sort. It applies only to combinations, and is primarily intended to transform a closed pool into an open pool in any case in which the effect of the closed pool is to restrict competition unreasonably. It would not, of course, bar civil or criminal action by government for antitrust violation involving agreements extending beyond the interchange of patent rights, nor would it bar private suit for damages by persons injured by illegal conduct.

(*b*) Provide by law that, in any suit for infringement of a patent when it is established (i) that the patent on which the suit is based covers an invention which is needed to produce a product or to practice a process in its most improved form; (ii) that the owner of the patent, in issue, or the person enjoying that patent with the owner's consent, or an affiliate of such owner or such person, alone or in combination with others, manufactures more than a reasonable share of such products or dominates the field of commerce in which such process is practiced; (iii) that the product or the process in a less improved form

has been produced or practiced by the owner of the patent in issue, or by the person enjoying that patent with the owner's consent, or by an affiliate of such owner or such person, under a patent which has since expired; (iv) that the patent in issue has been infringed; and (v) that the infringement occurred in the field of commerce dominated by the owner of the patent, or by the person enjoying the patent with the owner's consent, or by an affiliate of such owner or such person, then the court shall, if the patent is held to be valid and if the plaintiff is otherwise entitled to relief, determine a reasonable royalty for the use of the patent under a nonexclusive license, and shall decree both that the defendant pay damages computed on the basis of such a royalty for the past infringement, and that the defendant may enjoy the patent thereafter, provided he pay for the privilege on the basis of the royalty thus fixed by the court. This remedy should be in lieu of other relief and should be applied in the appropriate case to the exclusion of any defense based on the antitrust laws that the defendant may offer.

This is an attempt to prevent the perpetuation of patent monopoly by the continued acquisition of patents. An example may help to render it clear. Suppose a company A acquires a patent and starts to market a device which it covers, marking their product with the patent number, as they must if they wish protection. Later they acquire in various ways improvement patents, and add the numbers of these. The first, or basic, patent now expires. Company B wishes to enter the field, and is not constrained by the basic patent from doing so. It cannot, however, compete unless it incorporates some of the improvements which have rendered the device a superior article. Under present conditions it cannot enter, unless indeed there is a situation which warrants action under the antitrust laws. Under the above provision it could enter as soon as the basic patent expired. There is no severe hardship on the inventors of improvements, for they will be entitled to reasonable royalties. This suggestion, in other words, is an attempt to define basic and improvement patents in accordance with their uses, and to provide for compulsory licensing of the latter. It would not decrease the incentive to improve; on the contrary it would appear to enhance it. There are, no doubt, many objections which may be raised to it in its present form; there may be ways in which it can be partially circumvented in practice. Hence it needs examination and discussion. General compulsory licensing may be very damaging to incentives, and may indeed block the prompt introduction of advances in technology which require protection in their early stages because of their intrinsic hazardous nature from a commercial standpoint. But limited compulsory licensing, along some such lines as the above, might well remove numerous industrial roadblocks without doing any essential harm to the patent system as a whole.[59]

(*c*) Provide by law that, in any suit brought by the United States to enjoin violations of the antitrust laws, when it is established that

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[59] See *United States* v. *Hartford Empire Co.*, 65 F. Supp. 271, 274 (N. D. Ohio, 1946).
Compulsory Licensing of Patents, by Reik, American Economic Review, vol. 36, December 1946, pp. 811–832.
Patents, Antitrust Law, and Antitrust Judgments Through Hartford Empire, by Marcus, Georgetown Law Journal, vol. 34, November 1945, pp. 1–63.
U. S. Attorney General's National Committee To Study the Antitrust Laws, op. cit., pp. 255–259.

the defendant or defendants have (i) joined with others through an interchange of patent rights in a combination which unreasonably dominates a general field of commerce to which the interchanged patents pertain, and have, in so doing, (ii) violated the antitrust laws, then the court shall determine a reasonable royalty for the use of the patents being interchanged and shall decree that the defendant or defendants shall license all comers under such patents on reasonable terms, including the payment of the royalty fixed by the court as reasonable. This is supplementary to the provisions of paragraph (*a*) above, and is an attempt to arrive at a procedure for distinguishing between beneficent and injurious patent pools. It would be far better if the law could lay down a set of explicit criteria on which to determine whether a given patent pool is, or is not, in the public interest; but this seems to be very difficult to do. The proposals are, of course, in addition to existing law regarding restraint of trade, and are intended to prescribe a desirable procedure in cases where patent right interchange is involved.

For the purposes of the proposal in paragraph (*b*) above, the word "affiliate" must be defined broadly so as to include any subsidiary or successor organizations, as well as organizations or persons with whom there is some substantial relationship either through stockownership, intercorporate organization, contract, or otherwise.

The legislative proposals suggested above are intended to provide for compulsory licenses on reasonable terms in the limited situations where exclusive patent rights would otherwise work to the public disadvantage. The remedy of compulsory licensing should be employed only in special situations of this kind, however. If licenses were to be compelled under all patents, it would be impossible for the small enterprises, which form the heart of the Nation's industrial strength, to maintain themselves. The principle of general compulsory licensing is basically unsound. It would rob the country of the benefits which have in the past been substantially attributable to the patent laws. It is only in special situations, of the kind here mentioned, that the facts are such that the remedy of compulsory licensing may be used without attendant evil consequences.[60]

One of the interesting results of the operation of the patent system, not contemplated when it was instituted, is the stimulus to invention which is present when a profitable device is being manufactured under a group of patents, and others wish to enter the field and attempt to do so by the invention of alternates. If improvement patents were made subject to licensing as above this incentive would in one sense be reduced. The reduction would not be great if the courts set royalties which were indeed reasonable in the light of the hazards which attend all pioneering. On the other hand, there would be an added incentive to improve if a market were to be thrown open to competition of the usual sort upon the expiration of basic patents.

There is one other point in this connection which deserves mention. At times, when a really basic invention is made, the progress of the art is so slow that the original patent is close to expiration before practical introduction into use can be made. It is difficult indeed to provide adequately for those rare inventors who are thus many years ahead of their times. An extension of the statutory period of patent

[60] Cf. The United States Patent System, Vaughan, pp. 312–313.

monopoly could hardly be supported as a general matter. But really basic inventions of this sort often wait for the appearance of improvements which render them truly practical. Under such circumstances it seems clear that throwing the situation open to compulsory licensing at reasonable royalties at the time of expiration of the basic patent would in most cases not impede the introduction into use. It is on such matters as this that we need to remember that the main object of the system is to bring innovations into use for the benefit of the public, and to reward the inventor only as a part of the means for attaining this objective.

4. Obviate the possibility of the suppression of inventions

One object of the patent system is to bring new devices and processes into public use. Yet it often takes time and effort to prepare inventions for industrial introduction. A patent owner should be given full opportunity to do this properly. He should not be coerced into the giving of licenses during this initial period, as long as he uses diligence, commensurate with his resources and the importance of the invention in question, in developing and utilizing his patent. In the case of an independent and impecunious individual, due diligence may be found merely in the active search for funds with which to proceed. The owner of a patent, however, should either be in the diligent process of developing it, or he should be supplying the public need for the device or process it covers to the extent of his ability and resources. If the patent owner fails in doing this he should be compelled to license those who will carry out the development and fill the public need.

It is a proper business practice and consistent with the public interest, however, to make sure that new devices and products are sound before they are thrown upon the market. It is important, therefore, not to crowd an inventor or an industrial unit which is going about its business wisely and diligently commensurate with its resources. It is only when unreasonable delay results in the withholding of something valuable to the public that action should be taken to make the withheld item available. Whether or not money and time are being spent on the development or introduction is usually a good index of whether there is unreasonable delay in the marketing of a product.

It is possible to conceive of a situation in which a company is marketing a patented device, and at the same time holds patents on an improved device which it declines to introduce because of the disruption of its market which might be caused, so that it holds back on the improved device. As pointed out before, however, this is very unlikely in these days of intense technical competition.

Although instances are undoubtedly rare where unreasonable delay or suppression has deprived the public of a product which it wanted and which with diligence could have been made available, it is well to legislate in such a way that actual suppressions of inventions would be impossible. Such legislation is especially desirable so as to make it clear that such suppression is not an objective either of the patent system or of the proponents of the patent system.

Accordingly, the following suggestion for legislative action is made:

Provide by law that, in any suit for infringement of a patent, when it is established (i) that the plaintiff is neither using the inventions covered by the patent in question on a reasonable scale, nor developing

them for use to an extent commensurate with their importance, the public need, and his resources, nor licensing others who are prepared to do so; (ii) that the patent has been infringed; and (iii) that the infringement occurred in the field which the plaintiff failed to develop diligently, then the court shall, if the patent is held to be valid and if the plaintiff is otherwise entitled to relief, determine a reasonable royalty for the use of the patent under a nonexclusive license, and shall decree both that the defendant pay damages computed on the basis of such a royalty for the past infringement, and that the defendant may enjoy the patent thereafter, provided he pay for the privilege on the basis of the royalty thus fixed by the court. This remedy should be in lieu of other relief.

5. Determination of reasonable royalties

The legislation suggested in this statement calls in several instances for reasonable royalties to be determined by the courts. This is a very difficult determination to make.[61] Yet, unless the royalties thus to be fixed are adequately compensatory the remedies herein proposed will fail of their purpose and research important to the public welfare will be retarded, not stimulated. It is desirable, therefore, that certain criteria for determining a reasonable royalty should be specified in the controlling statutes. For example, a reasonable royalty should not only return a fair profit on the investment involved in developing and introducing the particular invention in question; to be reasonable it must yield a much greater return than this, since the investment in a successful invention is usually exceeded substantially by investment in unsuccessful attempts. The successful invention must bear the burden of carrying unsuccessful research. There should be express legislative recognition of that fact. Then, in determining what is a reasonable royalty, a court might well look for guidance to the general ratio of success to failure within a given field of endeavor. And one of the very best indexes of reasonableness would be the royalties usually charged in the industry in question under conditions of wholly free negotiation.[62] In addition, if the tribunal suggested above for the determination of facts in connection with patent litigation is established, provision might well be made for that same tribunal to establish reasonable royalties in particular cases, upon reference by a court, since it will be so constituted as to approach this problem with a technical background and a knowledge of industrial practice regarding patents which will seldom be directly and fully comprehended by the court.[63]

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[61] On problems connected with the determination of reasonable royalties, see: *United States* v. *Hartford Empire Co.*, 65 F. Supp. 271, at 274 (N. D. Ohio, 1946). *United States* v. *National Lead Co.*, 332 U. S. 319 (1947).
Standards for a Reasonable Royalty Under the Atomic Energy Compulsory Licensing Program, by Galane, Virginia Law Review, vol. 38, January 1952, pp. 53–68.

[62] *Dowagiac Mfg. Co.* v. *Minnesota Moline Plow Co.*, 235 U. S. 641, 648 (1914); Compensation for Compulsory Grant of Patent Licenses, by Krassa, 43 Columbia Law Review, p. 843 (1943); The New Measure of Damages in Patent Cases, by Fink, 29 Journal Patent Office Society, pp. 822, 823 (1947).

[63] Compare procedures for determining compensation to patentees under the Atomic Energy Act. See 42 U. S. Code 2181–2190.
See also, Galane, footnote 61, supra.
See also, Will the Patent Provisions of the Atomic Energy Act of 1954 Promote Progress or Stifle Invention? by Beckett and Merriman, George Washington Law Review, vol. 23, December 1954, pp. 195–213.

6. Other recommendations

The revisions of the patent system suggested above should enable the country to cope effectively with the changes in science and industry which have made the present patent system falter. There are other revisions which might also be suggested. Of particular importance is the proposal to terminate the patent grant 20 years after the date of the application.[64] It is not the intention of this statement, however, to duplicate the broad and detailed inquiry which the National Patent Planning Commission and other such bodies have conducted in the past.[65]

In 1 or 2 respects it is felt, however, that if the suggestions made above are adopted, several of the proposals of the National Patent Planning Commission may prove to be unnecessary. An example in point is the recommendation of the National Patent Planning Commission in its first report that there should be, in effect, compulsory licensing under all patents to the extent required by the national defense, the public health, or the public safety.[66] It is vitally important, of course, to protect the public interest in these fields, but it is also true that the benefits of the patent system in encouraging pioneering in these fields are equally great. To destroy the stimulus of invention and research in these fields might well result in a detriment to the public interest which would more than offset the objectives sought to be reached.

The broad suggestions made above in this statement should go far to correct the improper use of patents in the field of public health and safety, as well as in other fields. It is believed, therefore, that no legislation need be enacted at this time applying especially to patents in the field of national defense or the public health and safety. Rather it is suggested that the consideration of these special fields be postponed until experience has been obtained under the proposals made herein, or under similar proposals which might be substituted for them after further study.

D. CONCLUSION

The enabling legislation putting the Federal patent system into effect in this country dates from 1790. There has been substantially no revision or adaptation of the fundamental concepts of that legislation—other than by judicial interpretation—since 1836.[67] It is evident that, if the original objective and purposes of the patent system are to be fulfilled under modern conditions, some adaptation and modernization of its operation are essential. The suggestions herein

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[64] Such proposals to limit the period of the patent grant have been repeatedly introduced in the Congress, most recently by Senator O'Mahoney, as S. 3745, on April 26, 1956. For a history of these proposals, see: Proposals for Expediting Procedure in the Patent Office: A legislative history based primarily on congressional hearings, reports, and debates, prepared for the Subcommittee on Patents, Trademarks, and Copyrights of the Senate Committee on the Judiciary, by Margaret M. Conway, Legislative Reference Service, Library of Congress, March 20, 1956.

[65] U. S. National Patent Planning Commission, The American Patent System, Report, June 18, 1943 (78th Cong., 1st sess., H. Doc. No. 239), Washington, U. S. Government Printing Office, 1943.

[66] U. S. National Patent Planning Commission, The American Patent System, Report, footnote 65, supra, at p. 3.

[67] The Patent Act of 1952 was essentially a codification of existing patent law, and involved little substantive revision.

made need close study, and undoubtedly need modification and supplementation, before they could safely and appropriately be made the basis for constructive legislation. It is strongly urged that full study be devoted to the subject by a representative and competent group. Changes of this general nature, if well worked out, would do much to insure a vigorous program of scientific research and a dynamic industrial society in the days of peace which we hope and trust lie ahead.

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